

IN THE CLAIMS:

The status and content of each claim is as follows:

1. (previously presented) A method for fabricating an article using photo-activatable building material, comprising the steps of:

depositing a uniform layer of the photo-activatable building material to a preselected surface with an applicator;

scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article; and

repeating the steps of depositing a uniform layer, with each layer being applied over an immediately previous layer, and scanning the layer with the plurality of light-emitting centers to selectively photo-activate the building material until the article is fabricated.

2. (original) The method of claim 1 wherein the light-emitting centers are one of: light-emitting diodes and laser diodes.

3. (original) The method of claim 2 wherein scanning is accomplished using a modified printing cartridge that includes, located at an orifice plate, at least one of: light focusing devices and light baffling devices.

4. (original) The method of claim 3 wherein the light focusing devices include lenses at nozzle locations and wherein the lenses are set at predetermined distances from the light-emitting centers.

5. (previously presented) The method of claim 1 wherein depositing a layer of the photo-activatable building material is accomplished by one of: silk-screening, spraying, or spinning the building material in a manner that deposits a uniform layer of the building material onto the preselected surface.

6. (previously presented) The method of claim 1, further including a step of, after the article is fabricated, curing the article.

7. (original) The method of claim 6 further including a step of, after curing, rinsing non-polymerized material off the article.

8. (withdrawn) An article fabricated using photo-activatable building material, comprising:

a plurality of thin layers, prepared by applying a thin layer of photo-activatable building material, wherein each thin layer is photo-activated prior to applying a next layer thereto to polymerize the photo-activatable building material and attach each successive layer to a previous layer.

9. (withdrawn) The article of claim 8 wherein photo-activating is accomplished using light-emitting centers that are one of: light-emitting diodes and laser diodes.

10. (withdrawn) The article of claim 9 wherein the light-emitting centers are disposed in a modified printing cartridge that includes, located at an orifice plate, at least one of: light focusing devices and light baffling devices.

11. (withdrawn) The article of claim 10 wherein the light focusing devices include lenses at nozzle locations, wherein the lenses are set at predetermined distances from the light-emitting centers.

12. (withdrawn) The article of claim 8 wherein applying a thin layer of photo-activatable building material includes one of: silk-screening, spraying, spinning, and lowering a platform a predetermined distance into a bath of liquid photo-activatable building material prior to each photo-activation.

13. (withdrawn) The article of claim 8 wherein, the article comprising the plurality of thin layers, after completion of application and photo-activation of the thin layers, is cured for a predetermined time.

14. (withdrawn) A system for fabricating an article using photo-activatable building material, comprising:

a fabrication printer comprising:

a controller, coupled to an applicator, and a transport, for activating the applicator to apply a thin layer of photo-activatable building material in a predetermined shape, and activating a plurality of light-emitting centers for photo-activating the thin layer of building material when the thin layer has been applied, and continuing activating the

applicator and the plurality of light-emitting centers successively in accordance with a preselected fabrication scheme until the article is fabricated,

the applicator, coupled to the controller, for, in response to signals from the controller, applying the thin layer of the photo-activatable building material in the predetermined shape to a preselected surface;

the plurality of light-emitting centers, coupled to be activated by the controller, for, when signaled to activate the thin layer by the controller, passing over the thin layer and photo-activating the thin layer of photo-activatable building material in accordance with a predetermined photo-initiation process to obtain polymerization of the building material;

wherein the applicator applies each successive layer to an immediately previous layer, and the plurality of light-emitting centers photo-activate each successive layer applied until the article is fabricated; and

a transport, coupled to the controller, for moving the preselected surface proximate to the applicator and the plurality of light-emitting centers in accordance with a predetermined scheme.

15. (withdrawn) The system of claim 14 wherein the light-emitting centers include one of: light-emitting diodes and laser diodes.

16. (withdrawn) The system of claim 15 wherein the light-emitting centers are disposed in a modified printing cartridge that includes, located at an orifice plate, at least one of: light focusing devices and light baffling devices.

17. (withdrawn) The system of claim 16 wherein the light focusing devices include lenses at nozzle locations, wherein the lenses are set at predetermined distances from the light-emitting centers.
18. (withdrawn) The system of claim 14 wherein the photo-activatable building material is applied using one of: silk-screening, spraying, spinning, and lowering a platform a predetermined distance into a bath of liquid photo-activatable building material prior to each photo-activation.
19. (withdrawn) The system of claim 14 wherein the applicator applies the layer of the photo-activatable building material to the preselected surface by one of: silk-screening, spraying, spinning the building material in a manner that deposits a thin layer of the building material onto the preselected surface in a desired conformation and a process of lowering a platform a predetermined distance into a bath of liquid photo-activatable building material prior to each photo-activation to obtain a plurality of photo-activated layers of building material.
20. (withdrawn) The system of claim 14, further including a curing oven, arranged to receive the article from the fabrication printer when the article is completed, for, upon direction by the controller, curing the article in accordance with a predetermined scheme;
21. (withdrawn) The system of claim 14 wherein the controller is further coupled to a rinsing unit and the rinsing unit is arranged to receive the article via the transport from the curing oven after curing and cooling, for rinsing non-polymerized material off the article.

22. (previously presented) A method for fabricating an article using photo-activatable building material wherein light-emitting diode polymerization is utilized, comprising the steps of:

laying down a uniform layer of photo-activated polymer with a thickness suitable for selective photo-activation;

polymerizing a cross section of the article by selectively exposing the layer of photo-activated polymer to light;

raising an applicator used to lay down said layer of photo-activated polymer; and

repeating laying down layers and polymerizing a cross section of the article in each layer until the article is fabricated.

23. (original) The method of claim 22, further including a step of curing the article and, where desired, removing uncured photo-activated polymer by rinsing.

24. (withdrawn) A system for fabricating an article using photo-activatable building material, comprising:

a fabrication printer comprising:

a controller, coupled to a light-emitting array power and timing counter, and an X-Y drive, for activating the X-Y drive to activate a plurality of light-emitting centers for polymerizing a predetermined thickness of building material on a platform in a bath of liquid photo-activatable building material, and continuing activating the X-Y drive in accordance with a preselected fabrication scheme until the article is fabricated,

the X-Y drive, coupled to the controller, for, in response to signals from the controller, moving the plurality of light-emitting centers in accordance with the predetermined fabrication scheme;

the plurality of light-emitting centers, coupled to be activated by the light-emitting array power and timing counter, to a cooling unit, and to the X-Y drive, for passing over the layer and photo-activating the layer of photo-activatable building material in accordance with a predetermined photo-initiation process to obtain polymerization of the building material, wherein the cooling unit provides for heat removal from an area proximate to the light-emitting centers;

wherein the plurality of light-emitting centers photo-activate each successive layer until the article is fabricated; and

the platform, coupled to the controller, for moving the platform proximate to the plurality of light-emitting centers in accordance with a predetermined scheme to present a predetermined layer of photo-initiable liquid to the plurality of light-emitting centers in accordance with the predetermined photo-initiation process.

25. (previously presented) The method of claim 22, further including automatically transporting the article between stations for fabrication, curing and rinsing using a transport system.

26. (previously presented) A method for fabricating an article using photo-activatable building material, the method comprising:

depositing a uniform layer of the photo-activatable building material to a preselected surface with an applicator;

scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article;

repeating the steps of depositing a uniform layer, with each layer being applied over an immediately previous layer, and scanning each layer with the plurality of light-emitting centers to selectively photo-activate the building material until the article is fabricated;

curing the article in a curing oven following fabrication; and

automatically transporting the article between said applicator and said curing oven with a transport system.

27. (previously presented) The method of claim 26, wherein the light-emitting centers comprise light-emitting diodes.

28. (previously presented) The method of claim 26, wherein the light-emitting centers comprise laser diodes.

29. (previously presented) The method of claim 26, wherein scanning is accomplished using a modified printing cartridge that includes light directing devices located in an orifice plate.

30. (previously presented) The method of claim 29, wherein the light directing devices include lenses at nozzle locations and wherein the lenses are set at predetermined distances from the light-emitting centers.



31. (previously presented) The method of claim 26, wherein depositing a layer of the photo-activatable building material is accomplished by one of: silk-screening, spraying, or spinning the building material in a manner that deposits a uniform layer of the building material onto the preselected surface.

32. (previously presented) The method of claim 26, further including rinsing non-polymerized material off the article with a rinsing unit.

33. (previously presented) The method of claim 32, further comprising automatically transporting said article to said rinsing unit with said transport system.

34. (previously presented) A method for fabricating an article using photo-activatable building material, the method comprising:

depositing a uniform layer of the photo-activatable building material to a preselected surface with an applicator;

scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article;

repeating the steps of depositing a uniform layer, with each layer being applied over an immediately previous layer, and scanning each layer with the plurality of light-emitting centers to selectively photo-activate the building material until the article is fabricated;

rinsing the article in a rinsing unit following fabrication; and

automatically transporting the article between said applicator and said rinsing unit with a transport system.

35. (previously presented) A method for fabricating an article using photo-activatable building material, the method comprising:

depositing a uniform layer of the photo-activatable building material to a preselected surface with an applicator;

scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article; and

repeating the steps of depositing a uniform layer, with each layer being applied over an immediately previous layer, and scanning each layer with the plurality of light-emitting centers to selectively photo-activate the building material until the article is fabricated;

wherein said plurality of light-emitting centers are disposed in a modified inkjet print cartridge which is separate from said applicator.

36. (currently amended) A method for fabricating an article using photo-activatable building material, the method comprising:

depositing a uniform layer of the photo-activatable building material to a preselected surface with an applicator;

scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article; and

repeating the steps of depositing a uniform layer, with each layer being applied over an immediately previous layer, and scanning each layer with the plurality of light-emitting centers to selectively photo-activate the building material until the article is fabricated;

wherein said plurality of light-emitting centers are disposed in a modified inkjet print cartridge which is separate from said applicator; and

The method of claim 35, wherein said light-emitting centers are formed at or in place of firing resistors of said print cartridge, said light emitting centers are driven by circuitry for driving said firing resistors and light directing devices being disposed in an orifice plate of said print cartridge in correspondence with said light emitting centers.

37. (previously presented) The method of claim 35, wherein the light-emitting centers comprise light-emitting diodes.

38. (previously presented) The method of claim 35, wherein the light-emitting centers comprise laser diodes.

39. (previously presented) The method of claim 35, wherein the light directing devices comprises lenses.

40. (previously presented) The method of claim 35, wherein the light directing devices comprises baffles.

41. (previously presented) The method of claim 35, wherein depositing a layer of the photo-activatable building material is accomplished by one of: silk-screening, spraying, or spinning the building material in a manner that deposits a uniform layer of the building material onto the preselected surface.

42. (previously presented) The method of claim 35, further including rinsing non-polymerized material off the article with a rinsing unit.

43. (previously presented) The method of claim 42, further comprising automatically transporting said article to said rinsing unit with said transport system.

44. (previously presented) The method of claim 35, further including curing the article with a curing oven.

45. (currently amended) The method of claim 44, further comprising automatically transporting said article to said curing oven with said a transport system.

46. (withdrawn) A system for fabricating an article using photo-activatable building material, the method comprising:

means for depositing a uniform layer of the photo-activatable building material to a preselected surface; and

means for scanning the layer using a plurality of light-emitting centers to selectively photo-activate the layer of photo-activatable building material in accordance with fabrication of said article;

wherein said means for depositing and means for scanning are repeatedly operated with each layer being applied over an immediately previous layer and scanning with the plurality of light-emitting centers to selectively photo-activate the building material until the article is fabricated.

47. (withdrawn) A system for fabricating an article using photo-activatable building material, the method comprising:

means for repeatedly depositing a uniform layer of the photo-activatable building material to a preselected surface;

means for scanning each said layer using a plurality of light-emitting centers to selectively photo-activate that layer of photo-activatable building material in accordance with fabrication of said article;

means for curing or rinsing said article; and

means for automatically transporting said article to said means for curing or rinsing.